

REMARKS

Claims 1, 60-73 and 79-93 are pending in the application. Claims 94-96 have been canceled.

Applicants respectfully request reconsideration of the application in view of the following remarks.

Restriction/Election

In view of item 6 in the most recent Office Action, and in an attempt to expedite prosecution rather than address the issue on the merits in After Final prosecution, claims 94-96 have been canceled, without prejudice, as directed to a non-elected invention.

Claim Rejections under §112

Claims 1, 60-73 and 79-91 were rejected under 35 USC 112, first paragraph, for failing to comply with the written description requirement with regard to the recitation relating to the defining characteristic of the silicon dioxide layer on the aluminum layer, namely that it is configured to amplify a fluorescent signal from a labeled protein bound to the array. This rejection is respectfully traversed.

As noted in the remarks accompanying the previous response, the present inventors have discovered that the presence of a silicon dioxide coating of an appropriate configuration on the aluminum substrate surface can amplify the fluorescent signal used to read the arrays with resultant improvement in performance of the arrays in practice. In particular, that configuration is a thickness of the oxide that amplifies the signal. In a particular configuration, where the fluorescent signal is generated by Cy3 or Cy5 dyes, the thickness is between about 200 and 900Å. While the present application describes several embodiments, some with varying thicknesses of oxide layers, for example at page 21, lines 14-29, this particular embodiment has been found to result in the amplification of a fluorescent signal, is described at page 22, lines 5-14 and in Example 2 at page 36, lines 2-4, an embodiment of the invention to which claims 59 and 78, now canceled, were directed. Dependent claims 92 and 93, depending from claims 1 and 73 respectively, were added to recite the oxide thickness range of about 200 to 900Å.

The amendment of the independent claims to recite the more general characterization of a suitable silicon dioxide coating ("configured to amplify a fluorescent signal from a labeled protein bound to the array") is believed to be acceptable and adequately supported by written description in the disclosure. Both the general characterization and this specific range of a silicon dioxide coating suitable for amplification of a fluorescent signal are described in the

09/874,091
1680.002/CHIRP014

specification, in particular in the sections of the specification noted above. The recitation at page 22 to which the Examiner refers, while not verbatim, is believed to support the subject claim language, particularly when combined with the description a page 21, lines 13 to 18 which makes clear that the silicon dioxide coating may be configured to have the appropriate wavelength by deposition ("overcoating") in addition to etching ("thinning") of a pre-existing silicon dioxide layer. The explicit description of these two ways to achieve the appropriate a silicon dioxide coating of appropriate thickness it respectfully submitted to be adequate written description support for the subject claim language.

Accordingly, in view of these further remarks, it is respectfully submitted that the presently pending claims are in compliance with the written description requirement of 35 U.S.C. §112, first paragraph, and withdrawal of the rejection is respectfully requested.

Claim Rejections under §103

Claims 1, 60, 61, 63-66, 73, 79, 80, 82-85, 92 and 93 were rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 5,478,527 to Gustafson et al. ("Gustafson") in view of US Patent No. 5,831,070 to Pease et al. ("Pease"). Claims 62 and 81 were again rejected under 35 U.S.C. §103(a) as being unpatentable over Gustafson and Pease and further in view of US Patent No. 6,406,921 to Wagner et al. ("Wagner"). Claims 67-72 and 86-91 were again rejected under 35 U.S.C. §103(a) as being unpatentable over Gustafson and Pease and further in view of US Patent No. 5,482,867 to Barrett et al. ("Barrett").

The present invention is directed to arrays of protein-binding agents stably attached to the surface of a solid support, and kits incorporating such arrays. The arrays and kits are useful for conducting proteomic analyses such as differential binding assays in which the binding of a particular protein to an array element is detected by a fluorescence-based detection system (see, e.g., page 28, line 3 to page 30, line 13 and page 33, line 32 to page 34, line 7). The array is designed to optimize the effectiveness of this fluorescence-based detection system.

The claims have previously been focused on a particular embodiment of the invention in order to expedite prosecution. These claims recite an embodiment of the invention wherein an aluminum on glass substrate surface is coated with a particular configuration of silicon dioxide on the aluminum substrate surface that can amplify the fluorescent signal used to read the arrays with resultant improvement in performance of the arrays in practice. In particular, a suitable configuration is a thickness of between about 200 and 900Å for a preferred fluorescent signal generating dye set (Cy3 and Cy5). Claims 1 and 73 have been previously amended to recite that the solid substrate has a substantially planar surface comprising a layer of aluminum formed on a glass base material, the aluminum coated with a silicon dioxide coating configured to amplify a fluorescent signal from a labeled protein bound to the array, and dependent claims 92 and 93,

depending from claims 1 and 73 respectively, have been added to recite the thickness range of about 200 to 900Å.

The remarks regarding the cited art from the prior response are maintained. However, in an effort to simplify the issues for After Final prosecution, the following emphasizes aspects of those remarks which are believed to address the issues raised by the most recent Office Action. Reconsideration is respectfully requested.

Briefly, in rejecting the claims as obvious, the Examiner states that the recited functional property of the independent claims that the silicon dioxide coating is configured to amplify a fluorescent signal from a labeled protein bound to the array is inherent in the Gustafson disclosure. However, Gustafson provides no such explicit teaching and the disclosure of a broad range of silicon dioxide thicknesses for one purpose (in Gustafson, to enhance the diffraction grating signal detectable from the biograting) provides no guidance to a skilled practitioner about the thickness of silicon dioxide for another purpose (as disclosed and claimed, to amplify a fluorescent signal generated on an array). In particular, the Examiner notes that Gustafson discloses a range of silicon dioxide thickness of 200-3000Å and that that encompasses applicants claimed range of 200-900Å in claims 93 and 94. In this regard, the Examiner is referred to MPEP section 2144.05 wherein the subject of the obviousness of ranges is addressed. It is noted therein that result-effective variables can be optimized and that where the criticality of the claimed range can be shown, a *prima facie* case of obviousness can be rebutted. The disclosure in the present application relating to the criticality of both the claimed general concept and the claimed range is noted above in the discussion of the section 112 rejection and in the prior response. Gustafson lacks any disclosure of the general concept of fluorescence signal amplification and also lacks disclosure of the specific critical range cited in claims 92 and 93. For these reasons, it is again respectfully submitted that Gustafson, whether alone or in combination with other cited references, lacks disclosure sufficient to render the present claims obvious.

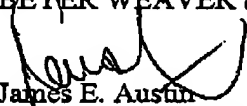
Moreover, a combination of the cited art would not would not achieve the present invention since each of the protein-binding agent array elements of the presently claimed invention comprises a peptidomimetic protein-binding segment configured to potentially bind a protein (see claims 1 and 73). To the contrary, a substantial proportion of the array elements of Gustafson are explicitly inactive, having been specifically deactivated so that they do not bind in order to form the biograting. This critical difference between the teachings of Gustafson, noted in the most recent response, was not addressed in the Final Office Action. It is respectfully submitted that this feature of the presently claimed invention alone is sufficient to distinguish over Gustafson, alone or in combination with the other cited references. Reconsideration of the rejections on this point is respectfully requested.

For at least these reasons, it is respectfully submitted that claim 1, and corresponding kit claim 73, of the present application are novel and patentable over the cited references. The remaining pending claims depend, directly or indirectly, from claim 1 or 73 and are thus submitted to be patentable for at least the same reasons. Thus, reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Conclusion

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below. If any additional fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge such fees to Deposit Account 500388 (Order No. CHIRP014).

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP


James E. Austin
Registration No. 39,489

Tel: (510) 663-1100